

Application Programming in AWIPS II

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Outline

- What is SPoRT?
- AWIPS I
- AWIPS II
- Plugins
- Experiences
- Plans
- Summary



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SPoRT

- Short-term Prediction Research and Transition Center
- NASA / MSFC Huntsville, AL
- Paradigm: Problems → Solutions
 - NASA Data and Technology
 - Operational NWS Short-term Forecasts
 - Native Decision Support System
 - Feedback Loop with Forecasters for Improvement
- Began in 2003
 - Primarily Southern Region
 - 9 WFOs
- In 2012
 - Partners in 5 NWS Regions, National Centers
 - 23 WFOs



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Programming in AWIPS I

- Limited scope of programmers
- Most users could only modify
 - Data
 - Configuration
 - Menus
 - Shell/Perl scripts
 - Database mods



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Enter AWIPS II

- Raytheon Technical Services Co. (RTSC)
- NWS Technology Infusion (AWIPS follow-on)
- Open source, Java-based
- Service Oriented Architecture
- Extensible, Plugin-based

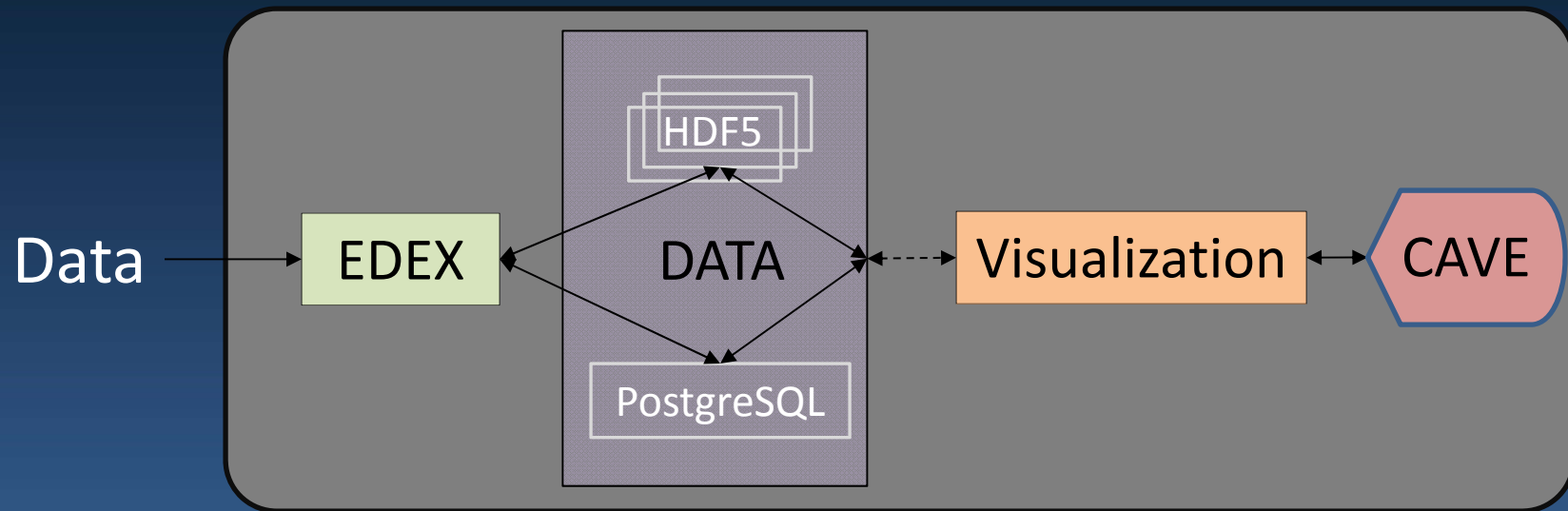
OBJECTIVE: **Collaborative development**



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AWIPS II Plugin Architecture



- EDEX plugin - handles data ingest; persists data in internal storage (HDF5 files) and writes metadata in the PostgreSQL database.
- DATA plugin - simply the container handling the data/metadata objects.
- VISUALIZATION plugin - communicates with the DATA plugin to retrieve data and write to CAVE resources.

What's needed for AWIPS II developers

- All Application Developers
 - Java; Python; Eclipse; XML; Subversion
- Application Integrators
 - JMS(ActiveMQ); ESB (Camel); MicroEngine
- Database Access Developers
 - Java DAO; Hibernate; Spring; EDEX; HDF5
- Graphical Interface Developers
 - CAVE; Eclipse RCP; SWT+Jface; SVG

-from the AWIPS II Software Development Guidelines document



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Wednesday, 9 January 2013 93rd Annual Meeting of the American Meteorological Society 7 of 16



SPoRT plugins

- Lightning Mapping Array
- Lightning Tracking Tool
- HMS Smoke & Fire
- Satellite
- Convective Initiation (UAHCI)



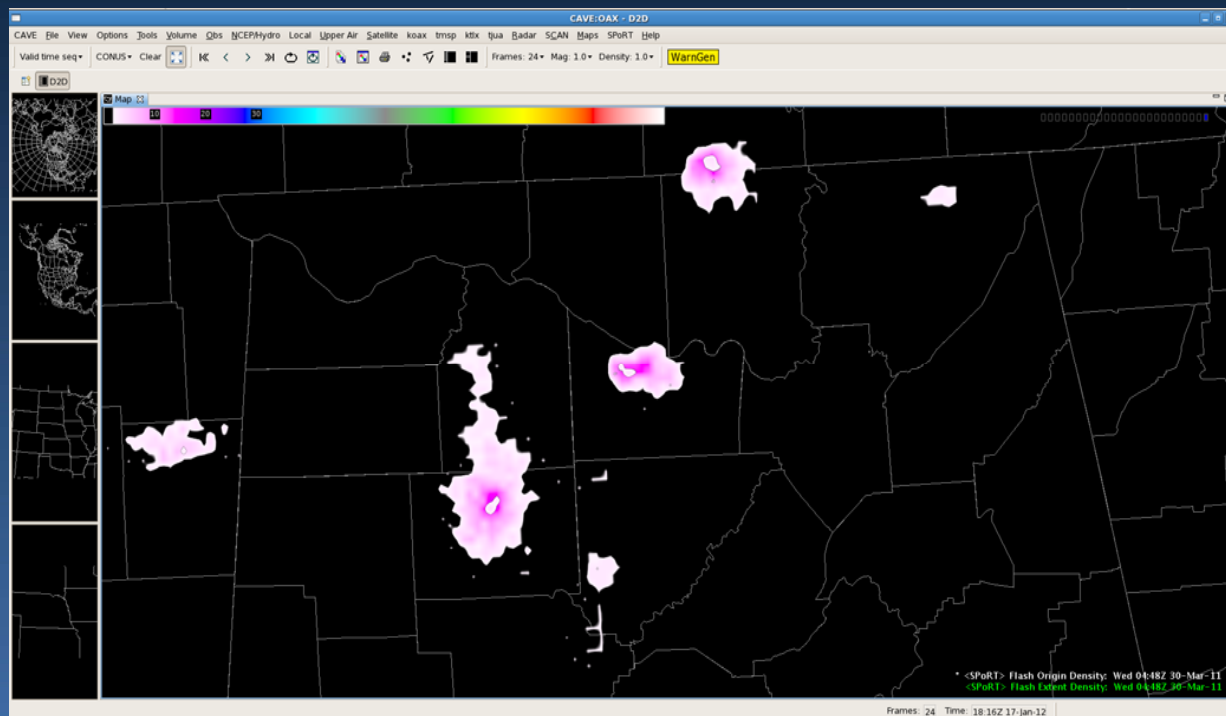
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Lightning Mapping Array

Total lightning data from Lightning Mapping Arrays (LMAs) is 3-Dimensional, unable to be brought into AWIPS I - except as model data. We expect to make use of future AWIPS II 3D capabilities.

LMA data is generated as ASCII, but we write as unique NetCDF – requiring a new EDEX plugin.



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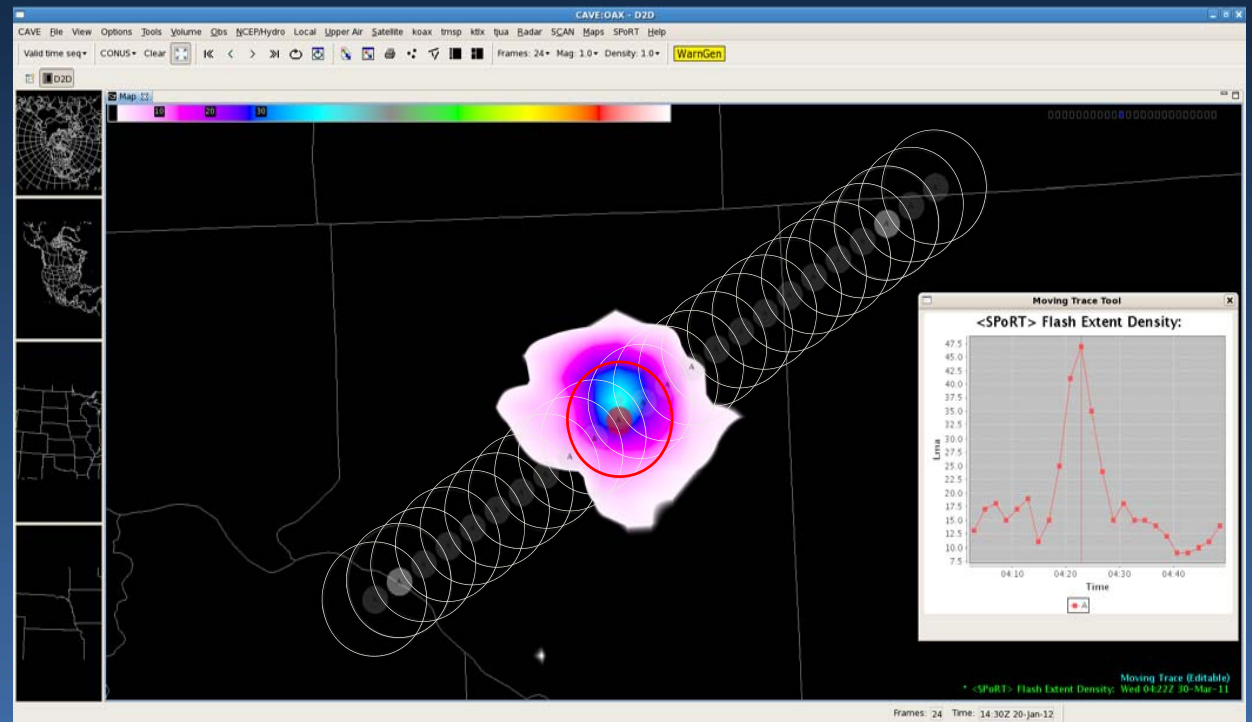
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Lightning Tracking Tool

Total lightning *jumps* are at times related to severe weather. Forecasters need to quickly track several storms separately, tracking their intensity.

- Track multiple cells
- Variable radii
- Adjustable storm tracking
- Color-coded chart for each data layer
- Extrapolation for new data (frames)



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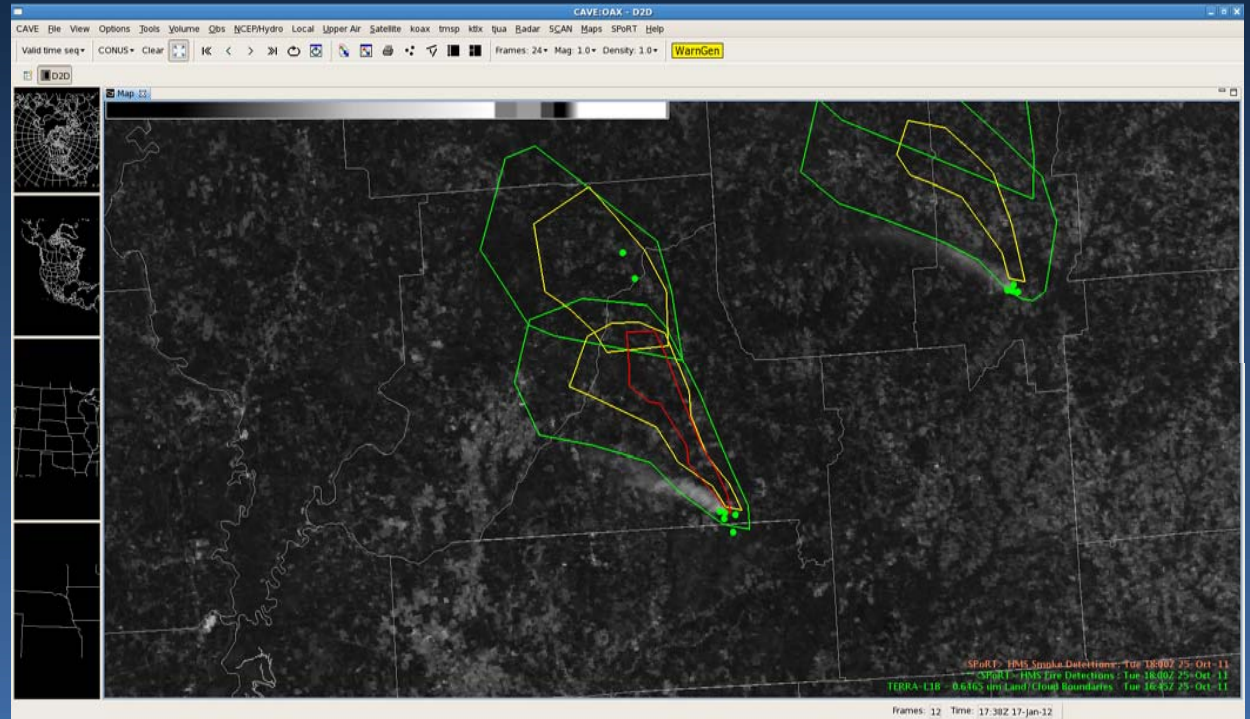
Wednesday, 9 January 2013 93rd Annual Meeting of the American Meteorological Society 10 of 16



NOAA HMS: Smoke & Fire

NOAA's Hazard Mapping System Hot Spot and Smoke data required new plugins because the hot spot point data needed special visualization (time-grouping) and the smoke regions needed special ingest code (KML).

DOM parser required



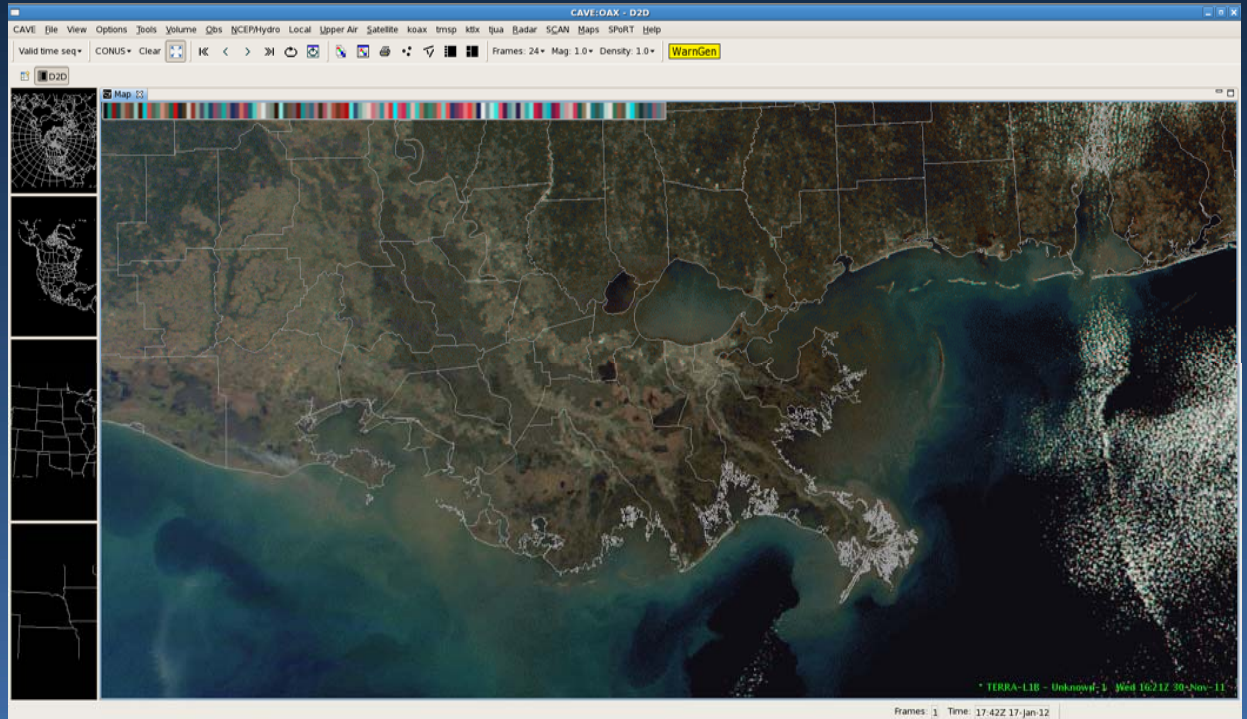
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Satellite / McIDAS AREA

We deal with a lot of data in McIDAS “AREA” format.

We’re using Raytheon’s extension of NCEP’s McIDAS plugin. We’re using the existing AWIPS II satellite plugin for visualization.



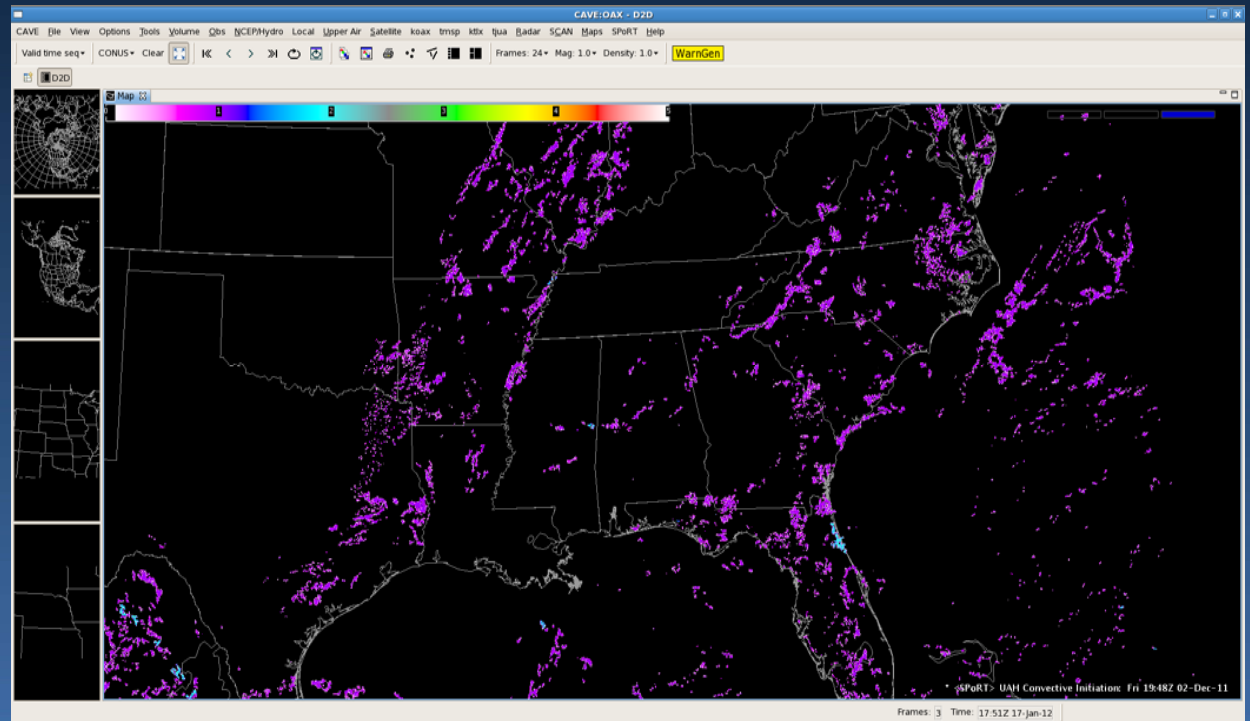
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Convective Initiation

GOES-based data set generated at UAHuntsville for short-term forecasts of convection.

Simple NetCDF format, but not natively read by AWIPS II. We wrote both EDEX and visualization plugins.



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Programming experiences

- Java and associated tools/parts are complex
- Frequent updates usually meant changing our plugins
- Lack of documentation made it harder
- We're beginning to need software management tools



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Plans

- Prepare plugins, colormaps, bundles for all current AWIPS I SPoRT products
- Create and/or extend plugins for upcoming datasets
 - Improve RGB with true 24-bit viz
 - Possible 3D viz efforts
 - Possible multi-byte datasets



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Summary

- SPoRT is preparing for AWIPS II
- AWIPS I offered *very* limited programming
- AWIPS II offers exciting opportunities for handling new data sets and visualization capabilities
- **Documentation is badly needed**



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Questions?

SPoRT: <http://weather.msfc.nasa.gov/sport/>



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